

Sub D1  
2310. (amended) The method of claim 2309, wherein one or more of the heat sources comprise at least two heat sources, and wherein superposition of heat from at least two heat sources pyrolyzes at least some hydrocarbons within the part of the formation.

2311. (amended) The method of claim 2309, further comprising maintaining a temperature within the part of the formation within a pyrolysis temperature range.

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2312. (amended) The method of claim 2309, wherein one or more of the heat sources comprise electrical heaters.

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2313. (amended) The method of claim 2309, wherein one or more of the heat sources comprise surface burners.

C3  
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2314. (amended) The method of claim 2309, wherein one or more of the heat sources comprise flameless distributed combustors.

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2315. (amended) The method of claim 2309, wherein one or more of the heat sources comprise natural distributed combustors.

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2316. (amended) The method of claim 2309, further comprising controlling a pressure and a temperature within at least a majority of the part of the formation, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure.

2317. (amended) The method of claim 2309, further comprising controlling the heat such that an average heating rate of the part of the formation is less than about 1 °C per day during pyrolysis.

Sub D2  
2318. (amended) The method of claim 2309, wherein providing heat from one or more of the heat sources to at least the portion of formation comprises:

C 336  
D2

heating a selected volume ( $V$ ) of the coal formation from one or more of the heat sources, wherein the formation has an average heat capacity ( $C_v$ ), and wherein the heating pyrolyzes at least some hydrocarbons within the selected volume of the formation; and

wherein heating energy/day ( $P_{wr}$ ) provided to the selected volume is equal to or less than  $h \cdot V \cdot C_v \cdot \rho_B$ , wherein  $\rho_B$  is formation bulk density, and wherein an average heating rate ( $h$ ) of the selected volume is about  $10^\circ\text{C}/\text{day}$ .

C 336  
D3

2320. (amended) The method of claim 2309, wherein providing heat from one or more of the heat sources comprises heating the part of the formation such that a thermal conductivity of at least a portion of the part of the formation is greater than about  $0.5 \text{ W}/(\text{m } ^\circ\text{C})$ .

C 5  
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2335. (amended) The method of claim 2309, further comprising controlling a pressure within at least a majority of the part of the formation, wherein the controlled pressure is at least about 2.0 bar absolute.

C 336  
D5

2342. (amended) The method of claim 2309, wherein allowing the heat to transfer comprises increasing a permeability of a majority of the part of the formation to greater than about 100 millidarcy.

2343. (amended) The method of claim 2309, wherein allowing the heat to transfer comprises substantially uniformly increasing a permeability of a majority of the part of the formation.

C 336  
D6

2348. (amended) A method of treating a coal formation in situ, comprising:  
providing heat from one or more heat sources to at least a portion of the formation;  
allowing the heat to transfer from one or more heat sources to a part of the formation; and  
controlling the heat to yield greater than about 60 % by weight of total condensable hydrocarbons, as measured by Fischer Assay.

Sub D6  
2349. (amended) The method of claim 2348, wherein one or more of the heat sources comprise at least two heat sources, and wherein superposition of heat from at least two heat sources pyrolyzes at least some hydrocarbons within the part of the formation.

2350. (amended) The method of claim 2348, further comprising maintaining a temperature within the part of the formation within a pyrolysis temperature range.

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2351. (amended) The method of claim 2348, wherein one or more of the heat sources comprise electrical heaters.

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2352. (amended) The method of claim 2348, wherein one or more of the heat sources comprise surface burners.

C7  
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2353. (amended) The method of claim 2348, wherein one or more of the heat sources comprise flameless distributed combustors.

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2354. (amended) The method of claim 2348, wherein one or more of the heat sources comprise natural distributed combustors.

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2355. (amended) The method of claim 2348, further comprising controlling a pressure and a temperature within at least a majority of the part of the formation, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure.

2356. (amended) The method of claim 2348, further comprising controlling the heat such that an average heating rate of the part of the formation is less than about 1 °C per day during pyrolysis.

Sub D7  
2357. (amended) The method of claim 2348, wherein providing heat from one or more of the heat sources to at least the portion of formation comprises:

C7 Sub D7  
heating a selected volume ( $V$ ) of the coal formation from one or more of the heat sources, wherein the formation has an average heat capacity ( $C_p$ ), and wherein the heating pyrolyzes at least some hydrocarbons within the selected volume of the formation; and

wherein heating energy/day ( $Pwr$ ) provided to the selected volume is equal to or less than  $h \cdot V \cdot C_p \cdot \rho_B$ , wherein  $\rho_B$  is formation bulk density, and wherein an average heating rate ( $h$ ) of the selected volume is about  $10^\circ\text{C}/\text{day}$ .

C8 Sub D8  
2359. (amended) The method of claim 2348, wherein providing heat from one or more of the heat sources comprises heating the part of the formation such that a thermal conductivity of at least a portion of the part of the formation is greater than about  $0.5 \text{ W}/(\text{m } ^\circ\text{C})$ .

C9 64 39  
2374. (amended) The method of claim 2348, further comprising controlling a pressure within at least a majority of the part of the formation, wherein the controlled pressure is at least about 2.0 bar absolute.

C10 Sub D10  
2381. (amended) The method of claim 2348, wherein allowing the heat to transfer comprises increasing a permeability of a majority of the part of the formation to greater than about 100 millidarcy.

2382. (amended) The method of claim 2348, wherein allowing the heat to transfer comprises substantially uniformly increasing a permeability of a majority of the part of the formation.

76 36  
5150. (new) The method of claim 2345, wherein at least about 20 heat sources are disposed in the formation for each production well.

C11 77  
5151. (new) The method of claim 2309, wherein the part of the formation comprises a selected section.

Sub D11  
5152. (new) The method of claim 2309, wherein the part of the formation comprises a pyrolysis zone.

Sub D11  
5153. (new) The method of claim 2309, wherein the part of the formation comprises a pyrolysis zone proximate to and/or surrounding at least one of the heaters.

5154. (new) The method of claim 2309, wherein at least one of the heaters is disposed in an open wellbore.

81 73  
5155. (new) The method of claim 2383, wherein at least about 20 heat sources are disposed in the formation for each production well.

82 39  
5156. (new) The method of claim 2348, wherein the part of the formation comprises a selected section.

C 11 Sub D12  
5157. (new) The method of claim 2348, wherein the part of the formation comprises a pyrolysis zone.

5158. (new) The method of claim 2348, wherein the part of the formation comprises a pyrolysis zone proximate to and/or surrounding at least one of the heaters.

5159. (new) The method of claim 2348, wherein at least one of the heaters is disposed in an open wellbore.

5160. (new) A method of treating a coal formation in situ, comprising:  
    providing heat from one or more heat sources to at least a portion of the formation,  
    wherein the heated portion of the formation is proximate the heat source;  
    allowing the heat to transfer from the portion of the formation to a part of the formation;  
    and  
    controlling the heat to yield at least about 15 % by weight of a total organic carbon content of the part of the formation into condensable hydrocarbons.

Sub D12  
5161. (new) The method of claim 5160, wherein one or more of the heat sources comprise at least two heat sources, and wherein superposition of heat from at least the two heat sources pyrolyzes at least some hydrocarbons within the part of the formation.

88 86  
5162. (new) The method of claim 5160, wherein the part of the formation comprises a selected section.

Sub D13  
5163. (new) The method of claim 5160, wherein the part of the formation comprises a pyrolysis zone.

C 11  
5164. (new) The method of claim 5160, wherein at least one of the heat sources comprise natural distributed combustors.

91 86  
5165. (new) The method of claim 5160, wherein at least one of the heat sources is disposed in an open wellbore.

Sub D14  
5166. (new) The method of claim 5160, wherein allowing the heat to transfer comprises substantially uniformly increasing a permeability of a majority of the part of the formation.

5167. (new) The method of claim 5160, wherein providing heat from one or more of the heat sources to at least the portion of formation comprises:

heating a selected volume ( $V$ ) of the coal formation from one or more of the heat sources, wherein the formation has an average heat capacity ( $C_v$ ), and wherein the heating pyrolyzes at least some hydrocarbons within the selected volume of the formation; and

wherein heating energy/day ( $Pwr$ ) provided to the selected volume is equal to or less than  $h \cdot V \cdot C_v \cdot \rho_B$ , wherein  $\rho_B$  is formation bulk density, and wherein an average heating rate ( $h$ ) of the selected volume is about 10 °C/day.